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Abstract

1,245,255. Lead bushing for accumulator ter- minals. VARTA A.G. 31 Oct., 1968 [11 Nov., 1967], No. 51637/68. Heading H1B. A lead socket for use as a bushing for accumu- lator terminals, is provided with one or more flanges 1, each being tapered in thickness to- wards its base over at least a part of its surface, as shown by the reference number 2 in Fig. 2, and has means, such as knurling 3, on the outer diameter of each flange to hinder rotation of the socket about its longitudinal axis. The lead socket can be welded to a terminal pole or to a cell connector. The lead socket can be made by casting or machining a blank with one or more flanges each of which is tapered outwardly to- wards its outer rim, and then compressing each flange so as to deform it in such a manner that it tapers inwardly towards its base, and by providing knurling on its outer surface.

1 245 255

PATENT SPECIFICATION

(11) 1 245 255

DRAWINGS ATTACHED

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B3A 49

(54) LEAD-SOCKET PROVIDED WITH LABYRINTH GLANDS

(71) We, VARTA AKTIENGESELLSCHAFT, of Frankfurt am Main, Neue Mainzer Strasse 54, Germany, a German Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a lead socket provided with one or more flanges, for use as a bushing for accumulator terminals.

In accumulators, and particularly in starter batteries, the production of bushings which are tight and remain tight, for example, for pole connections and cell connectors, presents particular difficulties.

It has almost become general practice to use bushings provided with pressed-in or injected lead sockets. The pole shafts are passed through bores provided in the lead sockets and the conductor or connector is welded to the pole shafts and lead sockets.

Pole bushings which may be sealed for example by rubber sockets, sealing bitumen or a casting resin are also known. These bushings are, however, also not reliable and are more expensive than seals produced by injected or pressed-in lead sockets.

The lead sockets hitherto used have been cast in moulds or have been injection-moulded. They are secured against turning or locked against being lifted out of the covers by means of projections and flanges. A substantial number of flanges were used in order to obtain a better seal by lengthening the creep distances.

The flanges of the lead sockets always taper in the direction of the external diameter. The seal between the material of the cover, or the material of the casing, and a lead socket is merely that resulting from a shrink fit which requires no preliminary treatment of the lead socket, for example with an adhesive agent. Thus the lead socket bushings in the covers of the cells or of the block are initially tight after their manufacture.

However, when the lead sockets are welded to the pole shaft and to the connector or to the terminal conductor, the seal between the lead socket and battery casing may be damaged by expansion of the lead socket caused by the heat required for the welding operation. Hairline cracks may be formed, as a result of differential thermal expansion, between the lead sockets and hard rubber or synthetic resin in the construction of the accumulator casing through which cracks the acid may pass thus creating a danger of corrosion damage.

The use of adhesive agents has hitherto failed to lead to any appreciable improvement of the seal betweeen lead sockets and the material of which the casing is made. This presents problems owing to the costly preliminary treatment of the lead sockets and soiling of the moulds when substantial quantities of adhesive agents are used. The effect of the adhesive agent is, moreover, impaired by the quantity of heat introduced by the welding operation.

It is also known that the seal may be improved by coating the outer surfaces of the lead sockets for example with bitumen. A lubricating packing also protecting the lead socket against corrosion is thus produced. This sealing method impairs the firm fit of the lead sockets. The treatment of such lead sockets is, moreover, costly and the moulds become soiled. Defects, such as cracks in the surrounding material, may be caused by partial peeling of the coating.

Hitherto no appreciable improvement could be obtained by treating the surface of the lead sockets with jets of sand or by using other roughening methods.

Leakage of lead sockets bushings of the known construction may be, in part, prevented by carrying out the welding operation in several stages, so that the effect of the heat upon the lead sockets and the surrounding material is reduced to a minimum. This requires, however, additional time and is a very costly procedure.

According to the invention there is

provided a lead socket for use as a bushing for accumulator terminals, which socket is provided with one or more flanges, each flange being tapered in thickness towards its base over at least a part of its surface and having means on its outer diameter effective to hinder rotation of the socket about its longitudinal axis when the socket is embedded in a matrix.

The invention also provides a method of manufacturing a lead socket, for use as a bushing for an accumulator terminal, which comprises casting or machining a lead socket blank with one or more flanges each of which is tapered outwardly towards its outer rim, and then compressing each flange so as to deform it in such a manner that each flange tapers in thickness inwardly towards its base over part at least of its surface and is provided with knurling on its outer rim.

The invention is hereinafter described and illustrated by way of example in the accompanying drawings in which:

Figure 1 is a side view and part sectional view of a lead socket after the initial casting,

Figure 2 is a side view and part sectional view of a completed lead socket, and

Figures 3A and 3B show vertical sections through lead sockets disposed in the top of an accumulator.

The lead socket blanks are advantageously produced by casting or injection-moulding in conventional manner. Figure 1 shows a lead socket blank of this kind. The individual flanges are denoted by the reference numeral 1.

In a subsequent operation, which may be carried out automatically, each flange 1 is compressed so that a knurling is formed on the outer edge of the flange and the flange tapers towards its base. The knurling affords the necessary resistance to torsion. Varying tapers may be obtained by varying the depth of the knurling. The tapers of the flanges have the effect of lessening the risk of the surrounding accumulator top material from becoming detached from the lead sockets during welding operations thereon. The lead socket according to the invention is shown in Figure 2. The walls of the flanges 1 which taper in thickness towards their bases, are denoted by the reference numeral 2 and the knurling is denoted by the reference numeral 3.

Figures 3*a* and 3*b* show in greater detail lead sockets 31 according to the invention after they have been pressed or injected into an accumulator cover 32 or accumulator casing. In Figures 3*a* the lead socket 31 is welded to a terminal pole 33 and in Figure 3*b* to a cell connector 34. The welding zone 35 is shown in both drawings by a hatched line.

Welding of the terminals or connectors to lead sockets as shown in Figures 3*a* and 3*b* may be carried out in one operation without the risk of leakage of the lead socket bushing. It has been found that by using lead sockets according to the invention, the risk of leakage of electrolyte from around the battery terminal is substantially reduced. Lead sockets of this kind have, moreover, an excellent resistance to torsion.

The lead socket may be manufactured by any suitable method for example by casting, and/or machining.

WHAT WE CLAIM IS:—

1. A lead socket, for use as a bushing for accumulator terminals which socket is provided with one or more flanges, each flange being tapered in thickness towards its base over at least a part of its surface and having means on its outer diameter effective to hinder rotation of the socket about its longitudinal axis when the socket is embedded in a matrix.

2. A lead socket as claimed in claim 1 in which said means comprises a knurled outer rim on each flange.

3. A method of manufacturing a lead socket for use as a bushing for an accumulator terminal, which comprises casting or machining a lead socket blank with one or more flanges each of which is tapered outwardly towards its outer rim, and then compressing each flange so as to deform it in such a manner that each flange tapers in thckness inwardly towards its base over part at least of its surface and is provided with knurling on its outer rim.

4. A lead socket substantially as hereinbefore described and illustrated in Figures 2, 3*a* and 3*b*.

5. A method of manufacturing lead sockets as claimed in claim 1 substantially as hereinbefore described.

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1245255 COMPLETE SPECIFICATION
2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 1

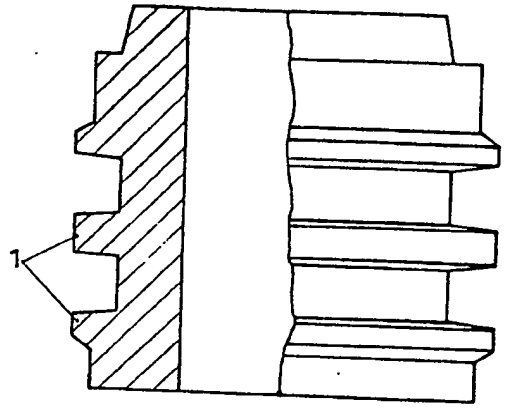

Fig.1

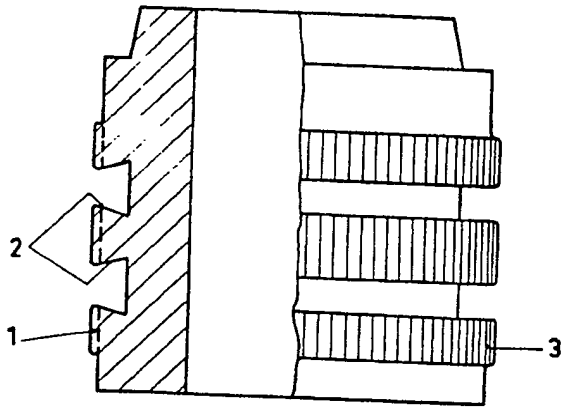

Fig. 2

1245255 COMPLETE SPECIFICATION
2 SHEETS This drawing is a reproduction of the Original on a reduced scale
Sheet 2

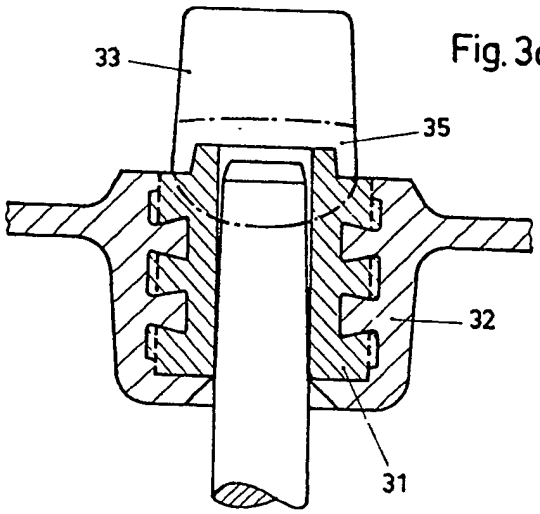

Fig. 3a

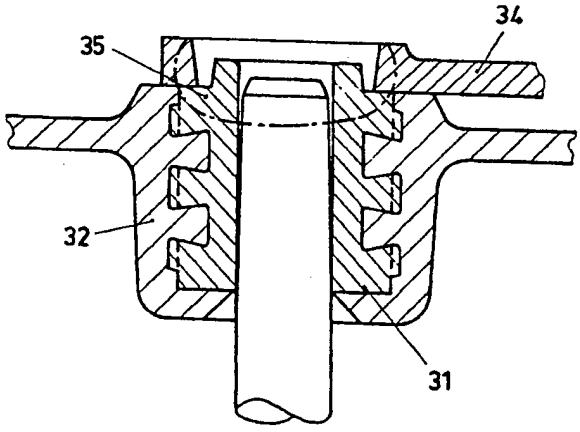

Fig. 3b